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# Seeed Studio XIAO ESP32C6

# Seeed Studio XIAO ESP32C6 Instruction Manual

Model: XIAO ESP32C6

# 1. Introduction

The Seeed Studio XIAO ESP32C6 is a compact and versatile single board computer designed for Internet of Things (IoT) and embedded projects. It integrates advanced wireless connectivity including 2.4GHz Wi-Fi 6, Bluetooth 5.3 (LE), Zigbee, and Thread (IEEE 802.15.4), making it suitable for a wide range of applications from smart home devices to industrial sensing. This manual provides essential information for setting up, operating, and maintaining your XIAO ESP32C6.



Image 1.1: Front view of the Seeed Studio XIAO ESP32C6 board, showing the USB-C port and main chip.

# 2. KEY FEATURES

- Enhanced Connectivity: Combines 2.4GHz Wi-Fi 6 (802.11ax), Bluetooth 5 (LE), and IEEE 802.15.4 radio connectivity, allowing for Thread and Zigbee protocols.
- Matter Native: Supports building Matter-compliant smart home projects for enhanced interoperability.
- **Security Encrypted on Chip:** Powered by ESP32-C6, it offers enhanced encrypted-on-chip security via secure boot, encryption, and Trusted Execution Environment (TEE).
- Outstanding RF Performance: Features an on-board antenna with up to 80m BLE/Wi-Fi range, and includes an interface for an external UFL antenna.
- Leveraging Power Consumption: Offers 4 working modes, with a low power consumption of 15 μA in deep sleep mode, and supports lithium battery charge management.
- **Dual RISC-V Processors:** Incorporates two 32-bit RISC-V processors, with the high-performance processor running up to 160 MHz and the low-power processor up to 20 MHz.
- Classic XIAO Designs: Maintains the compact thumb-size form factor of 21 x 17.5mm and single-sided

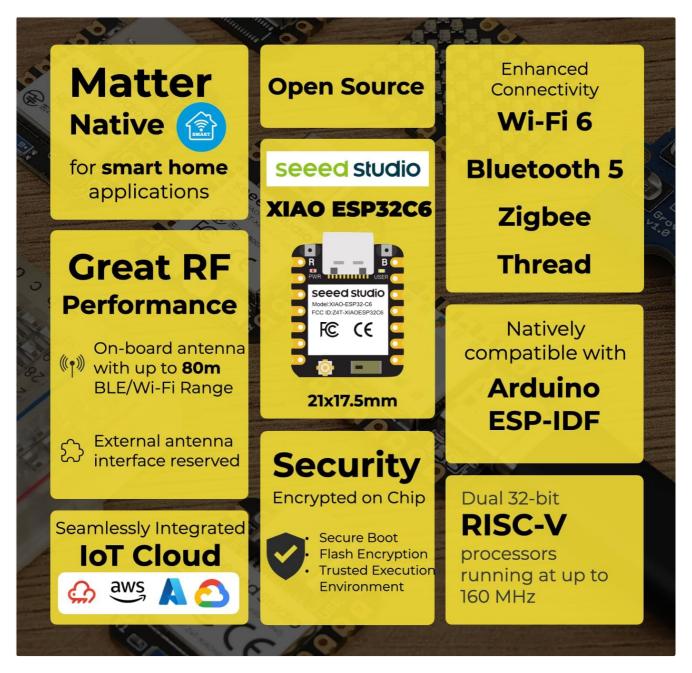


Image 2.1: Overview of the Seeed Studio XIAO ESP32C6's main features, including connectivity, security, and processing power.

#### 3. SETUP INSTRUCTIONS

Follow these steps to prepare your Seeed Studio XIAO ESP32C6 for use:

- 1. **Connect to Computer:** Use a USB-C cable to connect the XIAO ESP32C6 to your computer. The board will draw power from the USB connection.
- 2. **Driver Installation:** Depending on your operating system, you may need to install USB-to-serial drivers. Refer to the official Seeed Studio documentation for specific driver requirements and installation guides.
- 3. Integrated Development Environment (IDE) Setup: Install a compatible IDE such as Arduino IDE or ESP-IDF. Configure the IDE to support the ESP32C6 board. Detailed instructions for IDE setup are available on the Seeed Studio wiki or Espressif documentation.
- 4. **Power Supply:** The board can be powered via the USB-C port. For portable applications, it supports lithium battery charge management, allowing connection of a compatible Li-Po battery.

# 4. OPERATING INSTRUCTIONS

Operating the Seeed Studio XIAO ESP32C6 typically involves programming it with custom firmware. Here is a general workflow:

- 1. **Write Code:** Develop your application code using C/C++ in your chosen IDE (e.g., Arduino IDE, ESP-IDF). Utilize the available libraries for Wi-Fi, Bluetooth, Zigbee, Thread, and other peripherals.
- Compile: Compile your code within the IDE. This process translates your human-readable code into machineexecutable instructions.
- 3. **Upload:** Connect the XIAO ESP32C6 to your computer via USB-C. Select the correct serial port in your IDE and upload the compiled firmware to the board. The board may require entering bootloader mode by holding the BOOT button while connecting or resetting.
- 4. **Monitor Serial Output:** Use the serial monitor in your IDE to view debug messages and interact with your program.
- 5. **Power Management:** The XIAO ESP32C6 supports various power modes. Implement deep sleep or light sleep modes in your code to optimize power consumption for battery-powered applications.

#### 5. PINOUT DIAGRAM

Understanding the pinout is crucial for connecting external components and sensors to your XIAO ESP32C6. The board features a variety of digital, analog, and communication pins.

Image 5.1: Detailed pinout diagram for the Seeed Studio XIAO ESP32C6, illustrating GPIOs, power pins, and communication interfaces on both front and back sides.

Key pin functions include:

- Digital I/O (D0-D10): General Purpose Input/Output pins.
- Analog Inputs (A0-A2): Pins capable of reading analog sensor data.
- I2C, SPI, UART: Dedicated pins for common communication protocols.
- Power Pins: 3V3 (3.3V output), GND (Ground), VBUS (USB 5V input).
- BOOT Button: Used to enter bootloader mode for firmware uploading.
- RESET Button: Resets the microcontroller.
- BAT: Battery connection pads for Li-Po batteries.

### 6. Specifications

Feature	Specification		
Processor	Dual 32-bit RISC-V (High-performance up to 160 MHz, Low-power up to 20 MHz)		
Wireless Connectivity	2.4GHz Wi-Fi 6 (802.11ax), Bluetooth 5.3 (LE), Zigbee, Thread (802.15.4)		
RAM Memory Installed Size	0.5 MB		
Memory Storage Capacity	4096 KB (4MB)		
Operating Voltage	3.3V (via USB-C or battery)		

Feature	Specification
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Low Power Mode	15 μA in deep sleep mode		
Antenna	On-board antenna, UFL connector for external antenna		
Dimensions	21 x 17.5 mm		
Weight	Approximately 1.76 ounces (50 grams)		
USB Interface	USB Type-C		

# 7. MAINTENANCE

Proper maintenance ensures the longevity and reliable operation of your Seeed Studio XIAO ESP32C6:

- **Handle with Care:** The board contains sensitive electronic components. Avoid dropping or subjecting it to physical shock.
- Keep Dry: Protect the board from moisture and liquids, which can cause short circuits and damage.
- Avoid Extreme Temperatures: Operate and store the board within recommended temperature ranges. Extreme heat or cold can affect performance and component lifespan.
- Clean Gently: If cleaning is necessary, use a soft, dry brush or compressed air to remove dust. Avoid using liquids or abrasive materials.
- Static Discharge: Take precautions against electrostatic discharge (ESD) when handling the board, as ESD can damage sensitive components.

# 8. TROUBLESHOOTING

If you encounter issues with your XIAO ESP32C6, consider the following troubleshooting steps:

#### • No Power/LEDs Off:

- Ensure the USB-C cable is securely connected and functional.
- Try a different USB port or power source.
- If using a battery, verify it is charged and correctly connected.

#### • Upload Errors:

- Verify that the correct board and serial port are selected in your IDE.
- Ensure necessary drivers are installed.
- Try manually entering bootloader mode by holding the BOOT button while connecting or resetting the board.
- Check your USB-C cable; some cables are for charging only and do not support data transfer.

#### • Connectivity Issues (Wi-Fi/Bluetooth/Zigbee/Thread):

- Review your code for correct initialization and configuration of wireless modules.
- Ensure your antenna (on-board or external) is properly connected and not obstructed.
- Check for interference from other 2.4GHz devices.

#### Software/Firmware Problems:

- Consult the official Seeed Studio documentation, forums, and community resources for known issues and solutions.
- Ensure your IDE and board support packages are up to date.

# 9. WARRANTY AND SUPPORT

The Seeed Studio XIAO ESP32C6 is covered by the manufacturer's standard warranty. For detailed warranty terms, technical support, and additional resources, please visit the official Seeed Studio website or contact their customer service. Online forums and community platforms are also valuable resources for project assistance and troubleshooting.

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#### Related Documents - XIAO ESP32C6



#### Seeed Studio XIAO ESP32C6 Product Details and Getting Started Guide

Detailed information about the Seeed Studio XIAO ESP32C6, a powerful IoT development board featuring ESP32-C6 SoC, dual RISC-V processors, Wi-Fi 6, Bluetooth 5.3, Zigbee, and Thread. Includes features, specifications, and a getting started guide.



#### Seeed Studio XIAO Series Package and PCB Design Guide

Detailed technical specifications and PCB design guidance for the Seeed Studio XIAO series of miniature development boards, including SAMD21, RP2040, nRF52840, nRF52840 Sense, and ESP32C3. Features include pinouts, land pattern dimensions, and integration information. Learn about Seeed Fusion services for PCB assembly.



#### ODYSSEY-X86J4125 v2 User Manual | Seeed Studio Mini PC

Comprehensive user manual for the Seeed Studio ODYSSEY-X86J4125 v2 mini PC, covering package contents, specifications, quick start guide, storage expansion, connectivity, OS installation, and FAQ.



#### ODYSSEY-X86J4105 User Manual

User manual for the ODYSSEY-X86J4105, detailing its specifications, package contents, quick start guide, storage expansion, antenna connection, display connection, keyboard/mouse connection, powering up, operating system installation, 4G cellular connectivity, and pinout diagram.



#### SenseCAP Indicator User Manual - Seeed Studio

Comprehensive user manual for the Seeed Studio SenseCAP Indicator, a 4-inch touch screen IoT development platform powered by ESP32-S3 and RP2040, featuring Wi-Fi, BLE, LoRa, and air quality monitoring capabilities.



#### Seeed Studio BeagleBone Green Eco User Guide

Comprehensive user guide for the Seeed Studio BeagleBone Green Eco, detailing its hardware specifications, features, interfaces, power requirements, and pin definitions. Includes information on the AM335x processor, memory, connectivity options, and Grove ecosystem integration.

#### Documents - Seeed Studio - XIAO ESP32C6



#### Seeed Studio XIAO Series Packaging Upgrade - Product Change Notification

Product Change Notification from Seeed Studio detailing an upgrade to the packaging for the XIAO Series microcontroller modules. The new packaging includes a white waterproof shell, anti-static foam, and a certification information card. lang:en score:39 filesize: 417.07 K page\_count: 7 document date: 2025-05-20



### Carte XIAO ESP32C6: Développement loT avec WiFi 6, Bluetooth 5.0 et Zigbee

Découvrez la carte programmable Seeed Studio XIAO ESP32C6, idéale pour les projets IoT miniatures. Offre WiFi 6, Bluetooth 5.0, Zigbee, et un microcontrôleur ESP32-C6 performant.

lang:fr score:37 filesize: 31.01 K page\_count: 2 document date: 2024-12-14



### Seeed Studio XIAO ESP32C6 RF Exposure Evaluation Report

This report details the RF exposure evaluation for the Seeed Studio XIAO ESP32C6, including test results, limits, and procedures according to FCC regulations. lang:en score:37 filesize: 504.95 K page\_count: 8 document date: 2024-06-06



#### Seeed Studio XIAO ESP32C6: Tarjeta de Desarrollo IoT con Wi-Fi 6 y Bluetooth 5

Descubre la Seeed Studio XIAO ESP32C6, una potente y compacta tarjeta de desarrollo MCU basada en Espressif ESP32-C6. Ideal para hogares inteligentes, IoT y dispositivos portátiles, con Wi-Fi 6, Bluetooth 5, Zigbee y Thread. Explora sus características, especificaciones técnicas y aplicaciones.

lang:es score:36 filesize: 1.33 M page\_count: 6 document date: 2024-12-10



# Seeed Studio XIAO ESP32C6 Product Details and Getting Started Guide

Detailed information about the Seeed Studio XIAO ESP32C6, a powerful IoT development board featuring ESP32-C6 SoC, dual RISC-V processors, Wi-Fi 6, Bluetooth 5.3, Zigbee, and Thread. Includes features, specifications, and a getting started guide.

lang:en score:36 filesize: 288.38 K page count: 8 document date: 2024-06-12



#### Seeed Studio XIAO ESP32C6 Test Report

Official test report for the Seeed Studio XIAO ESP32C6 development board, detailing compliance with FCC Part 15 Subpart C standards. Includes results for conducted emissions, radiated emissions, power, bandwidth, and more, performed by Centre Testing International Group Co., Ltd.

lang:en score:31 filesize: 2.75 M page count: 32 document date: 2024-06-07



#### Seeed Studio XIAO ESP32C6 FCC Test Report | Compliance Certification

Official test report detailing the FCC compliance testing for the Seeed Studio XIAO ESP32C6 development board, including conducted and radiated emissions, power output, and bandwidth tests.

lang:en score:30 filesize: 4.62 M page\_count: 35 document date: 2024-06-06



#### Seeed Studio XIAO Series Packaging Upgrade - Product Change Notification

Product Change Notification (PCN) from Seeed Studio detailing packaging upgrades for the XIAO series of microcontrollers. This notification covers changes to the product packaging, including a new waterproof shell, anti-static foam, and updated certification information, affecting numerous part numbers.

lang:en score:30 filesize: 417.07 K page\_count: 7 document date: 2025-05-20



#### Seeed Studio XIAO Product Compliance Certificate - RoHS

This document certifies that various Seeed Studio XIAO series development boards comply with the European Union's Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU, as amended by (EU) 2015/863. Tested according to IEC 62321 standards.

lang:en score:29 filesize: 572.41 K page\_count: 3 document date: 2025-05-23



### Seeed Studio XIAO ESP32C6 FCC Test Report - RF Emissions and Compliance

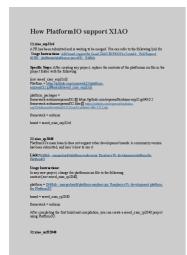
This document is the official FCC test report for the Seeed Studio XIAO ESP32C6, detailing RF emissions, conducted emissions, DTS bandwidth, power spectral density, and radiated spurious emissions according to 47 CFR Part 15 Subpart C. lang:tl score:29 filesize: 4.57 M page\_count: 42 document date: 2024-06-07



# <u>Seeed XIAO ESP32-C6 Datasheet: Wi-Fi 6, BLE 5.0, Zigbee, Thread Development</u> Board

Detailed datasheet for the Seeed XIAO ESP32-C6 development board, featuring ESP32-C6 SoC, 2.4 GHz Wi-Fi 6, BLE 5.0, Zigbee, Thread, 512KB SRAM, 4MB Flash, RISC-V processors, and extensive I/O for IoT projects.

lang:en score:28 filesize: 1.08 M page\_count: 3 document date: 2025-08-09



#### How PlatformIO Supports Seeed XIAO Boards

A guide detailing how to integrate Seeed XIAO development boards (ESP32C6, RP2040, nRF52840) with the PlatformIO development ecosystem, including configuration steps and necessary links.

lang:en score:23 filesize: 215.91 K page\_count: 3 document date: 2024-08-02



#### Seeed Studio 2024 Product Catalog: The Al Hardware Partner

Discover Seeed Studio's 2024 Product Catalog, your guide to the latest Al hardware, IoT solutions, and edge computing platforms. Explore sensors, development boards, software, and co-creation services designed for developers and industries. lang:en score:21 filesize: 26.89 M page\_count: 100 document date: 2024-04-07



#### Seeed Studio 2024 Product Catalog: The Al Hardware Partner

Discover Seeed Studio's 2024 Product Catalog, featuring cutting-edge AI hardware, sensors, edge computing solutions, software suites, and community-driven innovation for developers and businesses.

lang:en score:21 filesize: 21.25 M page\_count: 100 document date: 2024-04-29



#### Seeed Studio 2024 Product Catalog: The Al Hardware Partner

Explore the Seeed Studio 2024 Product Catalog, featuring the latest in Al hardware, sensor networks, edge computing, and software solutions. Discover innovative products for smart agriculture, industrial spaces, smart cities, and more.

lang:en score:21 filesize: 26.91 M page\_count: 100 document date: 2024-04-22



# Seeed Studio XIAO ESP32C6 Test Report - CTI EED32Q80454003

Comprehensive test report for the Seeed Studio XIAO ESP32C6 development board, detailing radio technical requirements, test summaries, and equipment specifications as conducted by CTI (Centre Testing International). Includes test results for frequency error, bandwidth, antenna power, emissions, and RF accessibility.

lang:en score:16 filesize: 494.59 K page\_count: 21 document date: 0000-00-00